Appendix A

Responsiveness Summary

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A Summary of Comments Received During the Public Comment Period

A-1. OVERVIEW

Operable Unit (OU) 2-13 is within Waste Area Group (WAG) 2 of the Test Reactor Area (TRA) at the Idaho National Engineering and Environmental Laboratory (INEEL). The unit contains 55 identified release sites contained within 13 operable units. Eight of these sites were determined during the comprehensive remedial investigation/feasibility study (RI/FS) to have contamination that poses a potential risk to human health and the environment and that requires remedial action to reduce or eliminate those risks. For the eight sites that include four disposal ponds, three subsurface soil contamination areas, and one area of windblown surficial soil contamination, remedial alternatives were evaluated, and preferred alternatives were selected. In addition to the eight sites of concern at OU 2-13, there were 47 sites that were determined to pose no unacceptable risk to human health or the environment and were identified by the agencies as recommended "No Action" alternative sites. A Proposed Plan that summarized the results of the RI/FS and presented the preferred remedial alternatives was released by the agencies for public review on March 10, 1997. Public review of this document took place between March 10, 1997, and April 9, 1997. An additional 30-day review period (to May 9, 1997) was requested and used by the Shoshone-Bannock Tribes. Public meetings were held in Idaho Falls, Boise, and Moscow, Idaho, on March 25, 26, and 27, 1997, respectively.

This Responsiveness Summary responds to both written and verbal comments received during the public comment period and meetings. Generally, support for the selected alternatives for each site was mixed.

A-2. BACKGROUND ON COMMUNITY INVOLVEMENT

In accordance with Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Sections 113(k)(2)(B)(I-v) and 117, a series of opportunities was available for public information and participation in the remedial investigation and decision process for OU 2-13, WAG 2 of the TRA, from 1991 to the present. For the public, the activities included receiving fact sheets that briefly discussed the status of investigations to date, *INEEL Reporter* articles and updates, a Proposed Plan, and focus group interactions, including teleconference calls, briefings, presentations, and public meetings.

On March 10,1997, the U.S. Department of Energy, Idaho Operations Office (DOE-ID) issued a news release to more than 100 media contacts concerning the beginning of a 30-day public comment period pertaining to the WAG 2 TRA Proposed Plan, which began March 10, 1997, and was extended to May 9, 1997. In addition, a fact sheet was sent to approximately 6,700 people on the INEEL Community

Relations Plan mailing list. Both the news release and fact sheet gave notice to the public that WAG 2 TRA investigation documents would be available before the beginning of the comment period in the Administrative Record section of the INEEL Information Repositories located in the INEEL Technical Library, the INEEL Boise Office, and public libraries in Fort Hall, Pocatello, and Moscow, Idaho. Following the announcement of the public comment period, 6,700 copies of the Proposed Plan were mailed to the public for their review and comment. In addition, public meetings were held at Idaho Falls, Boise, and Moscow, Idaho, on March 25, 26, and 27, 1997, respectively. Written comment forms were available at the meetings, and a court recorder was present at each meeting to record transcripts of discussions and public comments. A total of about 20 people not associated with the project attended the public meetings. Overall, 20 citizens provided formal comments; of these, 6 citizens provided verbal comments and 14 provided written comments.

This Responsiveness Summary has been prepared as part of the Record of Decision (ROD). All formal verbal comments, as given at the public meetings, and all written comments, as submitted, are included in the Administrative Record for the ROD. Those comments are annotated to indicate which response in this Responsiveness Summary addresses each comment. The ROD presents the preferred alternative for each site of concern and the recommendation for No Action for the remaining sites. The preferred alternatives were selected in accordance with CERCLA, as amended by the Superfund Amendments and Reauthorization Act, and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (the National Contingency Plan). The decisions presented in the ROD are based on information contained in the Administrative Record.

A-3. SUMMARY OF COMMENTS WITH RESPONSES

Comments and questions raised during the public comment period on the Proposed Plan for the WAG 2 Comprehensive RI/FS for OU 2-13 at TRA are summarized below. The public meetings were divided into an informal question-and-answer session and a formal public comment session. The meeting format was described in published announcements, and meeting attendees were reminded of the format at the beginning of the meeting. The informal question-and-answer session was designed to provide immediate responses to the public's questions and concerns. Several questions were answered during the informal period of the public meetings on the Proposed Plan. This Responsiveness Summary does not attempt to summarize or respond to issues and concerns raised during the informal part of the public meetings. However, the Administrative Record contains complete transcripts of these meetings, which include the agencies' responses to these informal questions.

Comments received during the formal comment session of the meetings are addressed by the agencies in this Responsiveness Summary. The public was requested to provide their comments in writing, verbally during the public meetings, or by recording a message using INEEL's toll-free number.

Comments on the Remedial Investigation Process

1. **Comment**: One commentor expressed concern that the investigative process not only repeated work already performed but ignored prior research, and felt that we should use all the results, not just recent results. He also mentioned some concerns related to chromium and strontium-90 in the aquifer and noted the studies should be as technical as possible. (T-I1, T-I6, T-I7, T-I8)

Response: It is acknowledged that much of the groundwater investigative work is very similar to work that has been conducted by the U.S. Geological Survey (USGS) for many years. All past and present available sources of information, including USGS sources, have been used to evaluate the site risks and extent of contamination at TRA. Sources of information used to evaluate site-specific risks can be found in the technical site-specific summary reports (i.e., Track 1 and Track 2 documents) for each site. Track 1 and Track 2 technical information can be found in the Administrative Record for WAG 2.

2. **Comment**: Even though one commentor thought that the investigations were thorough and that future monitoring would not be needed, another commentor brought up the "Hot Tree" incident and hopes that 20 or 30 plants across the site would be sampled. (W-11, W-30)

   Response: The scope of site-wide ecological sampling is being established during the OU 10-04 Comprehensive RI/FS. Other trees in the vicinity of the Hot Tree Site were sampled and found not to be contaminated. In addition, the CERCLA risk assessment process evaluates plant uptake factors for exposure scenarios such as ingestion of homegrown produce at sites of concern. The results of these risk evaluations help guide the type of remedial activity that is necessary to protect human health and the environment.

   There are several other entities that conduct ecological surveys across the site. They are the Radiological and Environmental Sciences Laboratory at the Central Facilities Area and the Environmental Research and Science Foundation in Idaho Falls. Copies of their survey reports can be made available to the public by calling 1-800-708-2680.

3. **Comment:** A commentor asked that audits and certification be conducted before remediation is approved, and that the applicability of ISO 14001, 4.4.4 be addressed. (W-1)

   Response: The CERCLA remedial action process requires pre-final and final inspections at completion of construction activities for long-term remedial actions or at completion of remediation for short-term remedial actions. The purpose of the inspection is to determine if all aspects of the plans and specifications have been implemented at the site and are performed with the U.S. Environmental Protection Agency's (EPA's) and State of Idaho's review, concurrence, and resolution of outstanding issues.

   In response to issues and needs identified in a recent DOE-ID and Lockheed Martin Idaho Technologies Company (LMITCO) assessment, LMITCO is initiating efforts to develop a LMITCO Environmental Management System (EMS). The objective of the EMS is to reinforce accountability for compliance and provide the tools and systems to achieve compliance. The framework for the system is based on ISO 14001, the international EMS standard.

4. **Comment**: One commentor stated that the cover's performance cannot be evaluated until it is designed and demonstrated, all of which should take place before the ROD is signed, not after. (W-42)

Response: The CERCLA remedial action process provides that alternatives are generally analyzed as part of the RI/FS process. However, resources are not spent developing specific details and specifications until the remedy is actually selected in the ROD.

The general barrier design anticipated for the Warm Waste Pond, for example, was implemented for the INEEL Stationary Low-Power Reactor (SL-1) closure cover. The long-term performance of this alternative is considered to be highly effective for preventing external exposure to contaminated surface soil. This basic design will be evaluated and modified as needed during the post-ROD remedial design process. See Sections 7 through 11 of the *Comprehensive Remedial Investigation/Feasibility Study for the Test Reactor Area Operable Unit 2-13 at the Idaho National Engineering Laboratory* (the OU 2-13 Comprehensive RI/FS) for additional supporting information.

5. **Comment**: One commentor noted that the Diesel Unloading Pit had an unlined soil and sand floor, rather than a concrete floor as expected. The commentor wanted to know when this was discovered and what other structures are constructed differently than expected. (W-28, W-29)

   Response: The Diesel Unloading Pit is the only site of concern at TRA known to have been constructed differently than expected. All other sites were found to be consistent with current documented construction descriptions. If new information is discovered in the future regarding these sites, this information will be considered and acted upon in the CERCLA 5-year review process. If the new information demonstrates that the selected remedy is fundamentally no longer valid to protect human health and the environment, then the CERCLA process provides that this decision would be revisited through a ROD amendment.

6. **Comment**: One commentor felt that, because the maximum concentration of contaminants detected was not reported simultaneously with the maximum contaminant levels (MCLs), it showed a "trivialized characterization of the problem." (W-M9)

   Response: It should be noted that MCLs only have meaning when compared to contaminant levels in drinking water or the aquifer. It would be misleading to list an MCL for soil because MCLs apply only to drinking water. Risk-based soil concentrations (which are analogous to MCLs for water) were thoroughly documented and listed in Appendix B of the OU 2-13 Comprehensive RI/FS.

7. **Comment**: A commentor felt that No Further Action for polychlorinated biphenyls (PCBs) was insufficient because 24 ppm is 96% of the limit of 25 ppm. (W-25)

   Response: While the PCB level is 96% of the 25-ppm limit, it is still below the limit. The 25-ppm limit for PCBs was established as part of the Toxic Substances Control Act (TSCA). The limit has been used as the basis of remediation at industrial PCB release sites located across the country. Because TRA is an industrial facility, 25 ppm is the standard to which cleanup would have taken place. Because the limit is protective of human health and the environment and none of the PCBs detected at the TRA release sites exceed the limit, no remediation of PCBs is necessary.

8. **Comment**: A commentor noted that remedial actions were being delayed because operations were ongoing. The commentor stated that the delays indicate that operations are more important than remediation, which the commentor held was unacceptable. (W-M32)

Response: The commentor is correct in stating that remediation of two sites (the Brass Cap Site and TRA-19) is being postponed until active operations in the vicinity are ended. The postponement is due to these two sites current inaccessibility and the lack of assurance that adequate cleanup could be achieved to eliminate the need for controls. Because the contamination is in the subsurface, there is no exposure to workers as long as the institutional controls are maintained. However, if the sites posed an immediate, unacceptable risk, remediation would not be delayed in favor of operations.

Comments on the Remedial Investigation Process: Contaminants

9. **Comment**: Two commentors listed contaminants that they felt should have been included in the RI/FS: tritium, carbon-14, uranium-234, neptunium-237, iodine-129, plutonium-238/239/240, nickel, zinc, lead, copper, ammonium; cyanide; benzene, diesel oil, kerosene, xylene, nitrates, nitrites, sulfates, and phosphates. (T-M1, W-M20)

Response: All contaminants that were detected during sampling at the TRA release sites were included in the RI/FS. These sampling investigations were conducted in a systematic manner that begins with a complete listing of all contaminants suspected of being present or those that are detected. This list is then screened on a site-by-site basis to determine the presence or absence of the contaminant at each site. Once this is completed, risk calculations are made based on the concentrations found. Contaminants that pose no risk are screened out. To be considered a contaminant of concern, risk analysis must indicate a potential unacceptable level of risk posed by the given contaminant. The contaminants identified by the commentor were given consideration during the RI/FS and received detailed analysis in the RI/FS, but they may not have been identified as contaminants of concern in the Proposed Plan. Two of the contaminants listed by the commentor (diesel fuel and kerosene) are not examined as such but are measured by their constituent products (xylene, benzene, etc.).

10. **Comment**: One commentor noted a comment by the State during the perched water investigation, OU 2-12, that the perched water zone may extend farther to the north than DOE recognized. In addition, he said that because the plume is connected to the Big Lost River flood zone, contaminants could be transported rapidly to the deep zone. (W-M14, W-M16, W-M17)

Response: These issues were evaluated during the previous OU 2-12 remedial investigation and resolved with the State. Flooding of the Big Lost River was modeled as part of that investigation. Analysis indicated that the Big Lost River has a very minor impact, if any, on the edge of the TRA perched water bodies compared to the volume of water being discharged as a result of routine operations. The No Action (with monitoring) decision finding from the investigation and resulting Record of Decision is still valid.

Comments on Risk Assessment

11. **Comment:** One commentor questioned whether it is reasonable to assume that a receptor (resident) would actually be exposed to contaminants at the site, and where that reasonableness is taken into consideration during the risk assessment process. (T-I9, T-I16)

    Response: It can be difficult to predict resident exposures 100 years into the future with certainty. However, it is reasonable to expect that government control will be maintained for at least 100 years. At that point, it is assumed for purposes of a CERCLA baseline risk assessment that a resident could live at TRA. The residential scenario, whether likely or not, is evaluated in the risk assessment process based on guidance from the agencies, and this conservative assumption is intended to ensure that cleanup alternatives are protective.

12. **Comment:** One commentor wanted to know which risks (by pathway) are current (during the institutional control period) and which risks will only be present in the future (after the institutional control period). Therefore, is the present construction of an engineered cover justified, even though it will increase risk to the groundwater? (W-32, W-35, W-36)

    Response: Table 1 of the Proposed Plan presents the calculated risks for workers and potential future residents at the TRA release sites. These risks were calculated assuming that no remedial actions would be taken at any of the TRA sites and that access controls to the sites would not be left in place. The results presented in Table 1 are the sum of risks calculated for workers and residents across all exposure pathways after an evaluation of contaminant ingestion, inhalation, and external radiation exposure. Details of these individual pathway risks can be found in Section 5 of the OU 2-13 Comprehensive RI/FS.

    The plan for constructing an engineered barrier over the Warm Waste Pond was developed to ensure that the pond's contamination would not be spread by wind erosion, and workers or potential future residents at the site would not receive radiation exposures from the pond's contamination. In addition, the barrier was developed to inhibit future excavation or intrusion into the contamination.

    It is true that the design will reduce evapotranspiration, which could result in more infiltration. In response to the commentor's concern about the increased hydraulic load to the aquifer as a result of an engineered cover, DOE re-ran the hydrologic models. The models increased the potential amount of flow into groundwater that would result from the engineered cover. Even considering the commentor's concern and a conservative doubling of infiltration, risk does not significantly increase and remains within acceptable risk levels.

13. **Comment:** One commentor, noting the graph of probable cancer per 10,000 exposed individuals, stated during the public meeting that the rate of 1 in 10,000 is not determinable in this population and, therefore, should not be used as a goal or as a limit, since its attainment cannot be proven. (W-53)

    Response: The 1 in 10,000 does not mean 1 person in 10,000 would contract cancer. It is a probability that any person exposed at those contaminant levels would contract cancer. As part of the Comprehensive RI/FS described in the OU 2-13 Proposed Plan, DOE worked closely with EPA and the State to ensure that risk assessment methods, including calculating risk probabilities, are in accordance with EPA guidance. These methods have been used to consistently evaluate risks associated with the TRA release sites and to identify the sites that have a potential for producing risks that exceed the CERCLA acceptable risk range.

Comments on Risk Assessment: Groundwater

14. **Comment:** A commentor cited the problem with cesium-137 levels in perched water: 176,000 times over the MCL, which will take 500 years to decay down to MCL levels, and will migrate into the aquifer, which is already considerably over drinking water standards. (T-M5, W-M12)

Response: The commentor's suggestion that cesium-137 levels in the perched water are 2,000,000 picocuries per liter (which is 176,000 times the MCL is incorrect. The highest level of cesium-137 detected was 9,920 picocuries per liter (80 times the MCL) in one shallow well at TRA in 1980. Cesium was last measured in this shallow well at 1,600 picocuries per liter (13 times the MCL).

Cesium-137 quickly absorbs to the soil or rock medium through which it passes. Therefore, it is not considered a threat to the aquifer because it will quickly become bound to subsurface material, where it will remain until it decays. This is demonstrated by the lack of cesium-137 migrating to the Snake River Plan Aquifer to date, including when discharge to the Warm Waste Pond was taking place at over 2 million gallons per year. Although it is acknowledged that Cs-137 levels in the shallow perched water are by no means trivial, models and historic monitoring indicate that cesium levels in shallow and deep perched water will not reach the aquifer at levels that could pose a risk. Therefore, this ROD does not alter the previous No Action with Monitoring decision for OU 2-12.

15. **Comment:** One commentor felt that residents would never need to inhabit the site, so the residential scenario for risk assessment is not necessary. Conversely, another commentor wondered how we would protect the residential use of the site after institutional controls are lifted and felt that the No Action decision is risky. (W-13, T-M5)

Response: As stated in the response to Comment 11, the assumption that someone will someday move to TRA is a conservative assumption that was made for risk assessment purposes. People may never live at the site, but we can be reasonably assured that no resident would be adversely impacted by the existing contamination if a potential future resident at the site in 100 years can be protected.

The No Action decision was recommended for sites that do not pose unacceptable residential exposure risks. Where contaminant releases have occurred, the risks were calculated in a conservative manner, indicating it is unlikely that minor contamination left in place at the sites will one day cause adverse health impacts to future residents. These decisions will be reevaluated to ensure that land use assumptions remain valid as part of the CERCLA 5-year review process.

16. **Comment:** A commentor thought that the Proposed Plan was inadequately reviewed regarding the effects of its preferred alternatives on the future groundwater pathway risk. (W-46)

Response: The OU 2-13 Comprehensive RI/FS Report and the Proposed Plan received numerous technical reviews, including reviews internal to LMITCO followed by reviews by EPA and the State. Areas of review include risk assessment, environmental compliance, quality assurance, groundwater, and legal.

Comments on Risk Assessment: Groundwater Modeling

17. **Comment**: One commentor referred to findings that revealed the presence of lava tubes that move water rapidly through the aquifer and exit at Thousand Springs. The commentor stated that it is unjustified and unacceptable for DOE to contend that "there is no current use of the perched water or contaminated Snake River Aquifer in the vicinity of TRA." The commentor questioned the decision to consider the potential use of the area for only a 125-year period. (W-M23)

Response: Lava tubes have been identified in the Snake River Plain basalts, but they are localized characteristics of the area's basalt flows. There is no evidence to suggest the possible presence of intact, uncollapsed lava tubes that could transport groundwater over very large distances beyond the INEEL to Thousand Springs.

DOE monitors drinking water wells at TRA to ensure that they are not producing contaminated water. If contaminated water were to be detected at one of these wells, measures would be taken to ensure that workers have clean drinking water. DOE also routinely monitors wells located off the INEEL in an attempt to detect groundwater contamination before it could reach water users downgradient of the site. Very little contamination has ever been detected in these off-site wells, and contaminant concentrations detected have been well below drinking water standards. Groundwater monitoring also is conducted independently by USGS and the State's INEEL Oversight Program.

All of the action decisions recommended in the Proposed Plan were based on risks that are expected within the next 100 years, but the OU 2-13 Comprehensive RI/FS evaluation was not limited to this time frame. The RI/FS includes analysis of a residential exposure scenario in 1,000 years, including computer modeling of groundwater. Remedial action objectives have been established to ensure that remediation will remain protective of human health and the environment until contaminant concentrations decrease to an acceptable level.

Comments on Risk Assessment: Ecology

18. **Comment**: Two commentors noted that the risk assessments consider occupational and residential scenarios but include very little biological monitoring. They felt that other scenarios, including Native American subsistence and recreation, should be considered. (T-M2, W-M26)

Response: In addition to the occupational and residential exposure scenarios, Native American subsistence and recreation scenarios were also considered but not evaluated individually. The residential scenario that is evaluated is the most conservative scenario (i.e., exposure to contaminants is greater, or more protective, under the residential scenario than under any other scenario). For this reason, the residential scenario provides the highest degree of protection.

19. **Comment**: One commentor wanted to know why the Paint Shop Ditch, the Radioactive-Contaminated Tank at TRA-614, and the Advanced Test Reactor Cooling Tower are not included as sites with human health risks greater than allowable levels. (W-19)

Response: All of these sites were included in the WAG 2 Comprehensive RI/FS. They were each evaluated in a manner that was consistent with the other sites in the RI/FS, and were found to have risks below the 1 chance in 10,000 threshold. Details on the risk assessment for the sites can be found in Section 5 of the OU 2-13 Comprehensive RI/FS.

Comments on Risk Assessment: Contaminants

20. **Comment**: Several commentors suggested that the actual values should be provided, rather than stating that concentrations are above MCLs or making unquantified statements. Also, one commentor wondered why tritium and chromium pose a health hazard even though they are below MCLs. (T-I9, W-16, W-21, W-M25, W-54)

Response: The commentor's implication that a reader is better informed when actual contaminant concentrations (values) detected are used in the Proposed Plan is well taken. In the future, greater care will be given to providing actual concentrations (values) in the documents written for public review. A complete description of the WAG 2 contaminant sampling investigations, including the detected contaminant concentrations (the actual values) in groundwater, is available and can be found in Section 4.4 of the OU 2-13 Comprehensive RI/FS.

With regard to the last concern noted above, tritium and chromium are the only two contaminants that currently *exceed* MCLs in the groundwater beneath TRA. Groundwater modeling of these contaminants predicts that they will be below MCLs before the end of the 100-year INEEL institutional control period. As a result, no one is expected to be exposed to these contaminants at concentrations that could cause adverse health effects.

21. **Comment:** One commentor asked if arsenic concentrations are currently below detection limits, why will there be concentrations producing risks of 3 chances in 1,000,000 at approximately 1,000 years in the future? (W-18)

Response: Arsenic is naturally occurring in soils and groundwater at TRA. Groundwater modeling predicts that the arsenic could migrate from surface soils down to the aquifer within 1,000 years. This migration would be caused by arsenic dissolving in rain and snowmelt moving through the unsaturated zone beneath TRA. The model predicts that the maximum risk from drinking arsenic-contaminated groundwater would be 3 chances in 1,000,000, and that risk would occur in 1,000 years. The fact that arsenic emerges as a contaminant of potential concern demonstrates the conservative nature of the risk assessment process.

22. **Comment:** One commentor stated that DOE should not eliminate from consideration those isotopes with half-lives greater than 5 years, especially cesium. He wondered if DOE would walk

away from sediments with high concentrations of cesium, and wanted to know which worst-case conditions were used for cesium to approach National Contingency Plan limits. (W-M22, W-M27, W-M30)

Response: The WAG 2 Comprehensive RI/FS did not eliminate any radionuclides from consideration based solely on radioactive half-life. All contaminants were evaluated for their potential to cause adverse impacts to human health and the environment, and contaminants that have the potential for producing adverse impacts were considered in the RI/FS. Cesium was one of the many contaminants that was retained for evaluation in the RI/FS, and its presence is the reason for many of the remedial action recommendations presented in the OU 2-13 Proposed Plan.

23. **Comment**: A commentor stated that the combined cancer risks for inhalation should be considered. Because risk from radionuclides is close to the National Contingency Plan limit, will the combined radionuclide and nonradionuclide risk be over the limit? (W-M24)

Response: The WAG 2 risk assessment considered the combined risks from multiple exposure routes, including inhalation and ingestion. For any site where the combined risks are over the acceptable limit, remedial action is being recommended. The "worst-case" conditions evaluated for soil ingestion assume that, in 100 years, a resident lives on the contaminated site for 30 years, 350 days per year, 24 hours per day, and ingests 100 milligrams of dirt per day.

24. **Comment:** One commentor contended that the sediment contains hazardous waste despite DOE's claims to the contrary. Also, even though DOE's tests show that the contaminants did not leach, how did perched water become highly contaminated if not through leaching? (W-M31)

Response: It is acknowledged that hazardous substances are contained in the sediments and soils at a number of release sites; hence, the need for investigation and cleanup. Hazardous wastes as defined by the Resource Conservation and Recovery Act (RCRA) were not generally disposed of at TRA with few exceptions. New information does suggest that, during its more than 40 years of existence, the Warm Waste Pond received minute quantities of RCRA-listed hazardous wastes. More information can be found in Section 9 of the ROD.

Direct infiltration of water that was disposed of in the Warm Waste Pond is the primary source of the vast majority of contamination in the pond sediments and the TRA perched water. This water contained contaminants that were produced by operations at TRA, and the discharge carried the contaminants directly to the perched water bodies. Contaminants leaching from sediments are not a significant continuing source of contamination. All discharges to the unlined Warm Waste Pond were discontinued in 1993, and there is no more contaminated water infiltrating to the perched water bodies from the Warm Waste Pond. Contaminated discharges from the TRA reactors that previously went to the Warm Waste Pond are now being sent to a lined disposal pond that does not allow water to infiltrate into the subsurface. All discharges to the disposal ponds will eventually cease, at which time the perched water bodies are expected to begin to dissipate.

Comments on Risk Assessment: Land Use

25. **Comment**: One person said that evaluation of risk at 100 years is not sufficient; it should be evaluated for 1,000 years or more. (T-M3)

Response: The assumption that in 100 years someone will actually build a home and live at TRA was made for the purpose of the comprehensive risk assessment. The evaluation was made because it is conservative. If the site can be remediated to be protective of human health and the environment in 100 years, it is anticipated to stay that way until contaminant concentrations decrease to acceptable levels and farther into the future. Additionally, this assumption is consistent with the Long-Term Land Use Future Scenarios for the Idaho National Engineering Laboratory.

All of the action decisions recommended in the Proposed Plan were based on risks that are expected within the next 100 years, but the WAG 2 Comprehensive RI/FS evaluation was not limited to this time frame. The RI/FS includes analysis of a residential exposure scenario in 1,000 years, including computer modeling of groundwater.

Comments on Alternatives

26. **Comment**: Several commentors said that efforts should be concentrated on the Chemical Waste Pond and the Warm Waste Pond to ensure that contaminants (especially mercury) are isolated and do not pollute the aquifer anymore. Also, a commentor suggested that the engineered cover needs to be demonstrated and reevaluated to see if it is really the best alternative for the long term as well as short term. (T-I2, T-I3, T-I10, W-33)

Response: The primary contaminant of concern at the Chemical Waste Pond is mercury. Contaminants of concern at the Warm Waste Pond include cesium-137, cobalt-60, and chromium. Computer modeling using GWSCREEN shows that these contaminants do not migrate readily to the aquifer. Annual average precipitation at the INEEL is approximately 10 cm per year. Infiltration rates as high as 23 cm per year have been modeled and have shown that residual contamination would not be expected to add to the cumulative risk in the aquifer. Essentially, the model tells us that more than two times the average annual precipitation could fall on sites of concern and the contaminants at the source still would not likely migrate to the aquifer.

The engineered cover is designed to isolate radioactive waste and to reduce surface exposures to background levels. This barrier design was implemented for the INEEL Stationary Low-Power Reactor (SL-1) closure cover. The long-term performance of this alternative is considered to be highly effective for preventing external exposure to contaminated surface soil. This basic design will be evaluated and modified as needed during the post-ROD remedial design process. Sections 7 through 11 of the OU 2-13 Comprehensive RI/FS contain additional cover design information.

27. **Comment**: One commentor wanted to know where excavated, contaminated materials (such as those from the Cold Waste Pond) were to be emplaced. Will they be shuffled around the INEEL to temporary locations, or when and where will they be permanently disposed of? (W-15, W-20, W-23, W-24)

Response: The disposal location for these materials will be determined during remedial design. It is reasonable to expect that soil excavated from the Cold Waste Pond will be placed in the adjacent Warm Waste Pond cell to reduce the "footprint" of contaminated soil at the TRA facility and because they contain the same contaminants. The Warm Waste Pond cells will then be covered by an engineered barrier that is designed for the length of time needed for radioactive contaminants in soil to decay within acceptable levels.

28. **Comment**: One commentor thought that the publications were valid and informative and that Alternative 3b is by far the best choice based on cost and the environment. (W-10, W-12)

Response: The Agencies agree that Alternative 3b, containment by capping with a native soil barrier is the preferred alternative at the Chemical Waste Pond and the Sewage Leach Pond based on effectiveness, cost, and the other evaluation criteria discussed in the Proposed Plan. This alternative appears in the ROD as the selected remedy for the Sewage Leach Pond and the Chemical Waste Pond.

Comments on Alternatives: Evaluation

29. **Comment**: One commentor felt that the short-term effectiveness rating for the Containment with Engineered Cover alternative was inaccurate because it rated the alternative as "good" for this criterion. The commentor stated that the alternative increased risks to the aquifer and posed additional worker risk in the short-term. Therefore, the alternative deserved to be ranked lower than the other alternatives. For the same reasons, the commentor also questioned the selection of the preferred alternative for the 1957 cell. (W-43, W-44)

Response: The plan for constructing an engineered barrier over the Warm Waste Pond was developed to ensure that the contaminated pond sediments would not be spread by wind erosion. This also ensures that workers at the site would not be exposed to radiation and that future intrusion or excavation would be inhibited. The proposed design of the cap could allow a small increase in the amount of water movement through the Warm Waste Pond sediments. Current modeling suggests that the increased infiltration expected by the design assumed in the Feasibility Study and Proposed Plan would not alter overall risk results. The commentor's observations concerning potential increased infiltration to the aquifer as a result of the cap and slight increases in worker risks in the short-term are legitimate. However, these concerns are not significant enough to adjust the relative rankings of the alternatives.

Comments on Alternatives: Cost

30. **Comment**: Commentors expressed concerns about the cost of covers and remedies with respect to their adequacy. Also, they stated that the public should know how much risk would be reduced per million dollars spent, but wondered if the calculations of risk to the public are reliable in the first place considering the uncertainty of whether the public will ever live at the site. (T-I12, T-I17, T-I18)

Response: One of the purposes of soliciting public comment on a Proposed Plan is to provide an opportunity for citizens to reflect their values concerning the expense of the proposed alternatives in relation to the benefits gained. A cost/benefit analysis of the various remedial alternatives for TRA releases was included as part of the WAG 2 Feasibility Study to illustrate the projected range of construction costs. Although risk reduction per dollar spent is not evaluated, this analysis considered the alternatives in terms of how well they met the nine CERCLA evaluation criteria versus the amount of money that would be spent to implement each alternative. The alternatives recommended in the OU 2-13 Proposed Plan produced the highest potential benefit-to-cost ratios when compared to other alternatives that could be implemented at each site. Cleanup is being recommended for sites that pose an unacceptable risk.

Comments on Alternatives: Design

31. **Comment**: One commentor wondered why we would use a native soil cover for the Warm Waste Pond 1964 cell when three of the criteria for such a cover are rated as poor. Because the native soil cover is combined with a riprap or cobble layer, it should really be called an "engineered cover." (W-22)

Response: The 1964 cell of the Warm Waste Pond is different from the other two cells because the majority of contamination was removed and approximately 10 feet of clean soil were placed in the pond as backfill. Therefore, the criteria apply more directly to the other cells where higher levels of contamination were placed nearer to the ground surface. In the case of the 1964 cell, the existing soil cover is an effective remedy. However, consistent with the other two cells, a cobble layer will inhibit future intrusion potential. The cover was not defined as an engineered cover because there is no intent to engineer the cover design beyond the existing soil cover, with the exception of the cobble layer.

Comments on Alternatives: Monitoring

32. **Comment**: One person stated that groundwater monitoring in fractured rock aquifers is very difficult, expensive, and has a low probability of detecting groundwater contamination until the contamination is fairly widespread. He then asked, "Will there be vadose zone monitoring at any of the sites to warn of contaminant movement to the aquifer before contaminants reach the aquifer?" (W-51)

Response: Groundwater monitoring has been conducted in and around the TRA since the late 1950s. The groundwater system is well understood because of the long history of monitoring. The groundwater monitoring network at the TRA under the OU 2-12 monitoring plan currently consists of six deep perched and three aquifer wells. This continued monitoring effort provides the necessary information for evaluation of contaminant migration trends between the perched water system within the vadose zone and the aquifer below. Therefore, no additional vadose zone monitoring will be performed at any of the sites.

Comments on Alternatives: Available Alternatives

33. **Comment**: One commentor stated that the failure to build a vitrification treatment plant identified in a 1977 EIS limited the RI/FS because fewer treatment alternatives were available. (T-M8)

    Response: From a practical standpoint, existing treatment capabilities may be given special consideration during an RI/FS. However, the lack of an onsite treatment facility in no way limits the technologies or alternatives considered during an RI/FS. New treatment facilities have been constructed to implement other INEEL RODs. Vitrification of contaminated soils was considered and eliminated as a viable alternative in the Feasibility Study. For more information about this proposed treatment, see Section 7.6 of the OU 2-13 Comprehensive RI/FS.

Comments on Groundwater

34. **Comment**: Several commentors stated that, because contamination in perched water will get into the aquifer eventually, we should pump and treat the perched water immediately and that we should monitor contamination levels after 20 years, then every 5 years after that. (T-M10, T-B1, T-B4, W-M13)

    Response: Groundwater contamination produced by the perched water system infiltration and disposal well injection was evaluated as part of the OU 2-12 perched water system remedial investigation in 1992. A ROD was signed for the TRA Perched Water System in December 1992. In that ROD, it was determined that no remedial action was necessary for the perched water system at the TRA, and the agencies continue to support that decision. This decision was based on the results of the human health and ecological risk assessments, which determined that conditions at the site pose no unacceptable risks to human health or the environment for expected current or future use of the Snake River Plain Aquifer beneath the perched water system at the TRA.

    In addition, it was determined in the ROD that groundwater monitoring would be conducted to verify that contaminant concentration trends follow those predicted by groundwater computer modeling. Based on 3 years of monitoring, the expected contaminant concentration patterns have been observed for most wells. In some cases, expected declines in tritium and chromium concentrations have not occurred, but concentrations are well below predictions in the OU 2-12 Perched Water RI/FS. Discontinuance of the discharges to the Warm Waste Pond appears to have caused a reduction in most, but not all, of the deep perched water wells. There has been a decline in hydraulic heads in the deep perched water system, but that decline appears to have been caused primarily by reduced discharges to the Cold Waste Pond. Contaminant flushing in the deep perched water system varies widely with location because of variations in hydraulic properties and the possible mixing and lateral spreading of the infiltration water and contaminants in the shallow perched water system. Continued monitoring of the perched water system and the aquifer is recommended in this OU 2-13 ROD.

35. **Comment**: A commentor stated that contaminated perched water should be pumped and treated. It was recommended that this be done using funds from nuclear material production. The commentor noted that groundwater contaminants behave in a variety of ways that raise

environmental and public health concerns. To address this, contaminated groundwater should be removed. (W-M18)

Response: The No Action (with monitoring) decision for the perched water below TRA was officially adopted upon the signing of the OU 2-12 ROD in 1992. No new information was developed during the OU 2-13 RI/FS to alter that decision or to justify expenditure of federal funds, regardless of source.

With respect to contaminants in groundwater, each contaminant may behave differently. That is why a remedial investigation seeks to identify the contaminants causing unacceptable risk. The behavior of these contaminants is studied, modeled, and considered when developing alternatives and selecting a preferred alternative (see the OU 2-12 Perched Water ROD for more information on why the agencies determined they would monitor rather than remediate groundwater). Please refer to the response to Comment No. 20 in regard to tritium and chromium concentrations in the groundwater below the TRA. Contaminant concentrations are predicted to fall below MCLs before the end of the 100-year INEEL institutional control period.

36. **Comment:** Three commentors felt that, because of the nature of the contamination (how the data peaks and trails off) and the nature of the aquifer (as a natural filter), there is no need to be concerned about the perched water because it will go away and the contamination will not get in the springs if dumping is stopped now. (T-I11, T-I14, T-I20)

Response: Computer modeling and monitoring data support the comment. Contaminant levels in the aquifer have steadily decreased since contaminant discharges ceased and are expected to continue to decrease to within acceptable levels before reaching future residents on or off what is now the INEEL. Please refer to the response to Comment No. 20 in regard to tritium and chromium concentrations in the groundwater below the TRA. Contaminant concentrations are predicted to fall below MCLs before the end of the 100-year INEEL institutional control period.

37. **Comment**: Commentors asked why strontium was not identified in addition to the cesium, especially because strontium is more mobile than cesium and has been detected since 1964 in the deep perched water zone. (T-I24, T-I25)

Response: Strontium-90 is identified as a contaminant of concern at the TRA surface sites and was evaluated in the risk assessment to determine the risk associated with exposure to this contaminant. As a contaminant of concern, strontium-90 contributes to the overall risk at the site. Remedial action will be conducted at those sites where the cumulative risk, of which strontium-90 is a contributor, exceeds acceptable levels. Note that sampling and analysis of strontium-90 will continue under the OU 2-12 ROD for both the deep perched water system and the aquifer.

Comments on Infiltration

38. **Comment**: Several commentors suggested the need for an infiltration barrier. Many commentors felt that the existing native soils or a bentonite seal cover would contain contaminants better than an engineered barrier, and that an engineered barrier would keep animals out but would increase the infiltration rate into the aquifer. In addition, they asked for results of containment studies and

comparisons. The commentors stated that, because the engineered barrier described in the Proposed Plan does not decrease infiltration, it is not really a containment barrier, so the name of Alternative 3a should not have the word "containment" in it. Also, using the native soils as a containment barrier should be a completely separate alternative. (T-I4, T-I5, T-I13, T-I15, T-I22, W-5, W-6, W-31, W-34, W-37, W-38, W-39, W-40, W-41, W-49, W-50, W-52)

Response: Based on computer modeling, in no case did the model predict that contaminants at the surface sites would migrate to the aquifer at concentrations of concern. This was true even when twice the annual average precipitation (23 cm/year) was input into the model. That was an important consideration when evaluating the two cover designs. Because migration of contaminants to the aquifer does not appear significant, the focus of the cover designs has been to inhibit exposure of contaminants to current and future receptors, rather than to prevent migration of those contaminants to the aquifer.

Though the use of an engineered barrier may increase the infiltration rate, computer modeling of two times the average infiltration shows that the risk to groundwater does not increase substantially. Both the engineered barrier and the native soil barrier were evaluated separately during the Feasibility Study. Results of the study evaluating these two barriers can be found in the OU 2-13 Comprehensive RI/FS Report contained in the Administrative Record.

39. **Comment**: Commentors asked what would happen if, after the engineered barrier is in place, future information indicates the barrier is ineffective? Would the barrier be removed? Why not put the engineered barrier in place in the future after institutional controls are removed? (W-45, W-47, W-48)

Response: Leaving the cover off would require that limited actions (institutional controls) be implemented. The Limited Action alternative was evaluated during the RI/FS and did not meet remedial action objectives as effectively as installation of an engineered barrier. The CERCLA process requires a review at least every 5 years after remedial action is completed to determine and ensure that the remedial action continues to be protective of human health and the environment. If, during that review, it is determined that the remedial action no longer is protective, then the agencies could determine what appropriate action would be necessary. If a fundamental change in the remedy were determined to be appropriate, a ROD amendment, including public comment, would be initiated.

Comments on Public Involvement

40. **Comment:** Some commentors stated that the documents and meetings should better educate the public. This should include providing specific numbers and facts, such as comparing contaminant levels to regulatory limits (e.g., drinking water standards) that indicate the magnitude of the contamination relative to a baseline. Another commentor stated that presenters should be better prepared and should not present conflicting information. Another commentor raised concerns about communication needing to be clear and to avoid the "fear factor" that might affect communication. Also, one commentor felt that the focus group did not reveal the true feelings of the participants. (T-M4, T-B2, T-B3, T-B5, W-M21, W-4, T-M9)

Response: As a result of a citizen's focus group held to review the draft Proposed Plan and accompanying fact sheet, a number of statements were added to the text of the final documents to add candor and acknowledge problems caused by the release of contaminants to the environment. With reference to the need for providing specific facts and comparisons of contaminant levels (such as drinking water standards) and not down-playing or trivializing the presence of contaminants, the agencies will continue to pursue improved methods to communicate information to the public. Because there are no legal standards dealing with or regulating concentrations of contaminants in soil similar to those for drinking water, risk-based standards are used or calculated. The DOE will reference established standards, when applicable, to aid citizens in determining when contaminant levels exceed legal standards.

Presenters strive to be prepared and have facts at hand but are subject to unintentional mistakes. When occasional contradictions arise during public presentations concerning proposed cleanup plans, the agencies will make every effort to have the issue resolved during the discussion. Meeting facilitators are instructed to provide the attention necessary to either resolve the conflict or ask the agency representatives to provide a response to the interested parties.

In response to one commentor's request, focus group members were polled concerning their feelings about the agencies' preferred alternative. Each focus group member was called and asked their opinion of alternatives proposed by the agencies. One person opposed the agencies' recommendation; three people would have liked more of an aggressive remedial action; one person felt that even though they supported the alternative, the recommendation went farther than it needed to; and three people agreed with the recommendation. (The original intent of focus group review of the draft documents was to offer suggestions concerning readability, layout, completeness, and user friendliness rather than concerning the remedies.)

41. **Comment:** One commentor stated that the information presented at the public meeting was important and educational, and lamented the fact that only one citizen attended. The commentor observed that some people spread the idea that the greater the fear—the greater the risk.. (T-B2, T-B3, T-B5)

    Response: The agencies would receive greater benefits if increasing numbers of citizens would interact with project managers during the open public comment periods. Citizens are invited to evaluate and suggest new methods of communicating and improving public participation.

42. **Comment:** While critical of aspects of the project, a commentor stated that it was good that the environmental and public issues were being addressed. (T-I21)

    Response: Comment noted.

43. **Comment:** One commentor representing a group wanted an extension for comments. (W-3)

    Response: In response to the request for an extension, the agencies extended the public comment period an additional 30 days.

44. **Comment:** One commentor supported the plan and implementation. (W-8)

Response: Comment noted.

45. **Comment:** One commentor asked whether access to public comments was available on the Internet. (W-2)

Response: All public comments received at the public meetings and compiled into meeting transcripts are available on the Internet under the OU 2-13 Comprehensive RI/FS at http://ar.inel.gov/home.html.

46. **Comment**: One commentor expressed frustration that public meeting dates were changed. (T-M7)

Response: With regard to having published different meeting dates in the draft and final plans, the DOE acknowledges and regrets the confusion that may have resulted from changes in meeting dates. The original intent of the draft, which contained tentative dates, was to allow eight focus group members an opportunity to review the user friendliness of the plan, and it was meant to be draft information. Following the review of the draft plan, the meeting dates were confirmed in the release of the final plan.

Comments on ER Programmatic Issues/DOE

47. **Comment:** A commentor noted that the contractor who operates the facility profits from expenditures on remediation, creating an incentive to pollute. The commentor also expressed concern about DOE self-regulation with respect to radioactive materials and called for an independent agency to oversee DOE activities. (W-M34)

Response: While having responsibilities for operations and environmental remediation may create a perception of an incentive to pollute, it is not believed to be true. Contractor incentives and awards as well as fines and penalties are based on compliance with environmental requirements. Deliberate actions of this nature would constitute prosecutable criminal behavior. The commentor's desire for independent oversight of DOE activities is achieved through State and EPA oversight of remedial actions.

48. **Comment:** The Shoshone-Bannock Tribes commented that they are primarily concerned that the contamination that has accumulated at the INEEL over the past 50 years will be cleaned up or mitigated to the maximum extent possible. In addition, all efforts should be made to alleviate impacts to the health, welfare, safety, and cultural and treaty rights of the Tribes and others on the Snake River Plain. The Tribes voiced the imperative need to respect and restore the environment. (W-14)

Response: The restoration process at the INEEL is designed to alleviate adverse impacts to human health and the environment. The long-term effects of accumulated contamination are addressed in this process, and risk-based review and cleanup provide the most effective means to identify, mitigate, and correct past practices.

Concerns With Previous Decisions

49. **Comment:** Several commentors expressed concerns about radionuclides (strontium-90 and cesium-137) not being permanently isolated in the Warm Waste Ponds. The commentors also expressed concerns about problems related to hot waste tanks TRA-15, TRA-16, TRA-19, and TRA-603/605. They stated that DOE is ignoring its cleanup responsibilities and should pursue containment strategies more aggressively. (T-M11, W-M10, W-M11, W-M15, W-M19, W-M28, W-M29, W-M31a, W-M33)

Response: It is recognized by DOE, EPA, and the State that there are a number of cleanup technologies that could have been or could still be applied at contaminated sites and that there are a number of opinions concerning what would be most effective. However, as stated in the Warm Waste Pond and the Perched Water Proposed Plans and RODs, the agencies believe the alternatives proposed and the decisions made were appropriate. The agencies have no plans to significantly alter the proposed alternatives contained in the Proposed Plan for the Comprehensive TRA OU 2-13 RI/FS.

At the time of the Interim Action ROD for Warm Waste Pond contaminated soils, the agencies knew that containment could be implemented to achieve the cleanup objectives established for that ROD. However, in the spirit of CERCLA and the National Contingency Plan (which has a preference for treatment where reduction of toxicity, mobility, and volume can be achieved), a treatment option was attempted. Because the treatment option was unproven, the first step was to conduct treatability studies to determine whether the treatment would work and how it should be implemented. A contingency remedy of a soil cover was included in the ROD in case the treatment option was not successful.

As the commentor noted, the treatability study demonstrated that some contaminants could be removed from the soil. However, insufficient contaminants could be removed to achieve the cleanup goals. In addition, costs were high, safety issues were increasing, and the volume of secondary wastes generated by the treatment was a concern. Thus, implementing the contingency remedy of a soil cover was deemed to be the best option by the agencies. This was especially true when considering that the contaminants of concern have relatively short decay rates (5 years half-life for cobalt-60 and 33 years half-life for cesium-137). The decision to implement the contingency remedy of emplacing a soil cover after consolidation of contaminated soil into a smaller area was made through an Explanation of Significant Difference to the Interim Action ROD for the Warm Waste Pond, as one of the commentor's noted.

Comments on Budget

50. **Comment:** A couple of commentors questioned the expense of cleanup considering the future land use of the site being questionable and that too much money has been spent to date on the risk assessment and characterization of these sites. (T-I19, W-53)

Response: The purpose of the CERCLA risk assessment is to provide the risk managers from the agencies with the information needed to make decisions regarding remedial action at a site. The risk assessment process has very specific guidance regarding the quantitative analysis of site-specific information necessary to make a determination if contaminants at a site pose an unacceptable or acceptable risk to human health and the environment. The question of whether a site poses an acceptable risk must be answered. The National Contingency Plan defines an acceptable risk range as 1 in 10,000 to 1 in 1,000,000. EPA uses this as a "target range" within which the agency strives to reduce risks as part of a Superfund cleanup.

Cost estimates for the alternatives analyzed were developed for comparison purposes. The actual cost of implementing the selected alternative will vary somewhat during actual design and implementation. The cost estimates described in the Proposed Plan were developed on the basis of a preliminary conceptual design. Many details are not well defined. These details are accounted for within a contingency cost element that is included in each alternative.

51. **Comment:** One commentor was disappointed that DOE had eliminated funding for the Agency for Toxic Substances and Disease Registry (ATSDR) for doing health consultations and stated that funding should be restored to allow health consultations on all RODs. (T-M6)

Response: DOE has just completed an interagency agreement with ATSDR to complete the health assessments required by CERCLA. DOE is providing funding under the agreement so ATSDR can meet its requirements under CERCLA. Health consultations are provided on DOE's request as needed and as determined necessary.

Comments on the TRA Facility Interface

52. **Comment:** Several commentors wanted to know how the schedules for the Materials Test Reactor, the Engineering Test Reactor, the Chemical Leach Pond, the Cold Waste Pond, and continued operations of TRA would impact cleanup. (W-7, W-9, W-17)

Response: During the past 40 years, TRA has provided facilities, utilities, and support capabilities for government and private agencies to conduct experiments associated with the development, testing, and analysis used in nuclear and reactor applications. Because past and present activities associated with TRA facilities and structures are "co-located" with TRA release sites identified in the FFA/CO, an analysis was performed to address the potential for causing current risk to be underestimated (see Appendix D of the OU 2-13 Comprehensive RI/FS). The analysis performed includes a review of past and present operational activities at TRA and associated facilities and structures, and management control procedures to prevent and mitigate releases. All facilities and structures that are operational, that are no longer being used for their original mission, or that are in standby or abandoned mode are included in this analysis. Based on the analysis performed of co-located facilities and activities and management control to prevent releases to the environment, only the Warm Waste Treatment System and the Engineering Test Reactor stack are identified to have the potential to impact comprehensive risk at TRA. The analysis does not identify any structures or facilities that posed an imminent threat of release. However, five-year reviews will evaluate changing conditions that could result in unacceptable risk.

Except for the Brass Cap Area and TRA-19 (which are being addressed by limited action with a contingent excavation and disposal option), it is not anticipated that current operations at TRA will inhibit cleanup operations.

Editorial Comments

53. **Comment:** One commentor suggested changing "and" to "sand" in the last paragraph of page 30 of the Proposed Plan. A commentor noted editorial changes suggesting "North Storage Area including North Storage Area Soil Contamination Area" (page 31, first paragraph) should be set off as a heading or made into a complete sentence. (W-26, W-27)

    Response: Comments noted.

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